

DOCUMENT RESUME

ED 117 573

CE 006 290

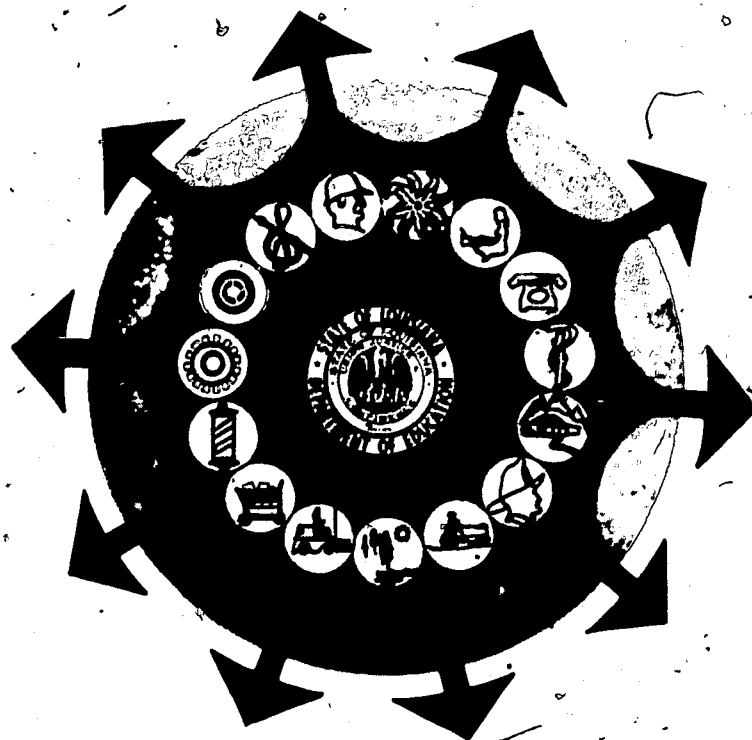
AUTHOR Nuschler, Alexandra; And Others
TITLE Geometry. Mathematics Curriculum Guide (Career Oriented).
INSTITUTION Louisiana State Dept. of Education, Baton Rouge.
REPORT NO Bull-1280; VT-102-469
PUB DATE May 74
NOTE 55p.; For related documents, see CE 006 282-294
EDRS PRICE MF-\$0.83 HC-\$3.50 Plus Postage
DESCRIPTORS Behavioral Objectives; *Career Education; *Curriculum Guides; *Geometry; Learning Activities; Mathematical Applications; Mathematics Curriculum; *Secondary Education
IDENTIFIERS Louisiana

ABSTRACT

The curriculum guide correlates concepts in geometry with career-oriented concepts and activities. The curriculum outline format gives the concepts to be taught, matched with related career-oriented performance objectives, concepts, and suggested instructional activities in facing page layouts. The suggested curriculum outline is compatible with all books on the approved textbook list for Louisiana. The outline is divided into the major sections of elements of geometry, introduction to proof, lines and planes, congruence, polygons and polygonal regions, circles, similarity, trigonometry, plane coordinate geometry, and solid figures. (NJ)

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MATHEMATICS CURRICULUM GUIDE CAREER ORIENTED GEOMETRY

BULLETIN NO. 1280

Louisiana State Department of Education
Louis J. Michot, Superintendent
1974

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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MATHEMATICS CURRICULUM GUIDE

(CAREER ORIENTED)

GEOMETRY

LOUISIANA STATE DEPARTMENT OF EDUCATION

Louis J. Michot

State Superintendent

May 1974

VT. 102469.

ACKNOWLEDGEMENTS

Appreciation is expressed to the original writing team which worked so diligently in developing the materials and ideas included in the guideline.

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Finally, we express our gratitude to Superintendent Louis J. Michot, who has been the spearhead in promoting the concept of career education for all, and to the Louisiana Legislature which recognized the need for such a program and saw that funds were made available to carry on this worthwhile endeavor.

PREFACE

The first working draft of the Mathematics Curriculum Guide Secondary Level was distributed for field testing for the 1973-74 academic year. Feedback indicated that the materials were appropriate for the purposes as stated in the original preface.

The materials presented herein have been changed from the original only in that the mathematical language has been made as uniform as possible for clarity and to conform to the texts adopted by the State of Louisiana. Additional career learning activities have been introduced.

The format has been revised so that it should be easier to correlate the curriculum outlines and performance objectives with the related career oriented concepts and learning activities.

The reader who is seeing the materials for the first time can be assured that the career approach of these guidelines in no way weakens the present program. As in all good educational procedures, materials are included so that all levels may be served. In addition to the ambitious minimum recommendations the guidelines contain ample materials for those students who need to be challenged.

Mathematics is embedded in all of the disciplines and makes a solid base for experiences in career education. This is borne out by the numerous references and career activities from the spectrum of life.

The student is led in a systematic development that is designed to provide for continuous progress. Dignity of the person was always foremost in devising and revising the guidelines. The goals were set to give maximum development of the individual through all types of educational experiences.

Finally, our schools will always have a basic curriculum. The methods of instruction will be constantly changing, and the counselors will continue to lend their influence in guiding the pupil. The career education goals which are interwoven with the traditional will help make more productive citizens of Louisiana's most important assets, its children.

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Area

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Volume

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GEOMETRY

GEOMETRY

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

I. Elements of Geometry

I. Elements of Geometry

A. Foundations of Geometry

A. To demonstrate a basic understanding of the foundations of geometry, the student should be able to:

1. Undefined terms

1. Explain why undefined terms are needed and identify some basic undefined terms

2. Defined terms

2. Identify some basic defined terms and use them correctly in statements

3. Assumptions

3. Explain why it is necessary to assume some statements to be true.

4. Theorems

4. Distinguish between conjecture and theorem.

5. Intuitive approach

5. Explain intuitively why several given theorems are true.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES.

1. Career Concept

Careers are affected by
the ability of individuals to
relate to each other.

Performance Objectives

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

B. Symbols and sets

1. Identification

2. Specification

3. Set operations and relationships

4. Venn diagrams

B. To demonstrate an understanding of symbols and sets in geometry, the student should be able to:

1. Identify:

- a. Geometric symbols
- b. A set as finite or infinite
- c. The empty set ϕ
- d. The universal set

2. Specify a set by:

- a. Rule (set builder notation)
- b. Roster (list)

3. Define:

- a. The union of two sets
- b. The intersection of two sets
- c. The complement of a set
- d. One-to-one correspondence
- e. Equality of two sets
- f. A is a subset of B
- g. A is a proper subset of B

4. Illustrate existing set operations and relationships by the use of Venn diagrams.

**RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES**

- B. The draftsman must be familiar with geometric symbols and use them in producing drawings as prescribed by specifications.

**RELATED CAREER ORIENTED
LEARNING ACTIVITIES**

- B. Examine a house plan and from this list the geometric symbols to identify terms such as electrical outlets, door openings, windows, bathroom fixtures, etc.

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

C. Geometric concepts

1. Point
2. Line
3. Plane
4. Line segment
5. Ray
6. Angle

D. Basic postulates

E. Lines

1. Horizontal
2. Vertical
3. Intersection
4. Parallel

- C. To demonstrate an understanding of basic geometric concepts, the student should be able to identify and illustrate:

1. Point
2. Line
3. Plane
4. Line segment
5. Ray
6. Angle

- D. To demonstrate an understanding of postulates, the student should be able to state some basic postulates. (e. g., for any two points there is exactly one line that contains them.

- E. To demonstrate an understanding of lines, the student should be able to define, identify, or illustrate:

1. A horizontal line
2. A vertical line
3. The possible intersection of two coplanar lines.
4. Parallel lines.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

E. The surveyor checks the alignment of a structure by using a plumb line.

E. To construct a makeshift plumb line, tie a metal nut (or other small, heavy object) to one end of a piece of string. Attach the other end of the string to the top of a stake. To assure that the stake is driven vertically into the ground, keep the plumb line parallel to the stake while driving it.

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

5. Skew
6. Perpendicular
7. Transversal

F. Angles

1. Definitions

2. Measurement

3. Classification

4. Angle pairs

5. Skew lines
6. Perpendicular lines.
7. A transversal

F. To demonstrate an understanding of angles, the student should be able to:

1. Define, identify, and sketch an acute angle, a right angle, an obtuse angle, a straight angle, a reflex angle, and a dihedral angle.
2. Determine the measure of an angle by using a protractor.
3. Classify angles from their measures {e.g., $m(A) = 60^\circ$, $m(B) = 90^\circ$, $m(C) = 120^\circ$, $m(D) = 180^\circ$, $m(E) = 260^\circ$ }
4. Define, identify, and sketch adjacent angles, vertical angles, complementary angles, supplementary angles, congruent angles, and a linear pair of angles.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
<p>F. A navigator of an airplane uses angles in constructing a scale drawing to determine the location of a plane.</p>	<p>F. Make a scale drawing showing the point of departure and the position of an airplane at the end of a three-hour flight on a course of 60° at ground speed of 250 m. p. h.</p>

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

G. Definitions and construction

1. Definitions

2. Angles

3. Triangles

4. Regular polygons

5. Bisector of a line segment

6. Bisector of an angle

7. Perpendicular lines

G. To demonstrate an understanding of fundamental constructions by using a compass and straightedge, the student should be able to:

1. Define triangle, polygon, regular polygon, segment bisector, and angle bisector.

2. Copy a given angle.

3. Construct a triangle given:

- Two angles and the included side.
- Three sides
- Two sides and the included angle

4. Construct regular polygons of three sides, four sides, and six sides.

5. Construct the bisector of a line segment.

6. Construct an angle bisector.

7. Construct a perpendicular to a given line:

- At a point on the given line
- From a point not on the line

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES.

- G. An artist usually draws freehand using only a pencil and paper, whereas the draftsman uses construction instruments such as dividers, T-squares, French curves, etc.

A craftsman uses basic constructions to lay out geometric shapes.

RELATED CAREER ORIENTED LEARNING ACTIVITIES

- G. Draw a regular hexagon free-hand. Measure each angle carefully. Are they of equal measure? Construct a regular hexagon. Measure these angles. They should measure 120° .

A circular metal rod, 3" in diameter, is to be machined so that a vertical cross section will be a square of maximum size. Construct such a square on one of the ends (vertical cross section of the circular rod.)

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
8. Parallel lines	8. Construct a line parallel to a given line.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

II. Introduction to Proof

A. Conditional sentence

B. Nature of proof

C. Proofs of simple theorems

II. Introduction to Proof

A. To demonstrate an understanding of a conditional sentence, the student should be able to identify and illustrate a conditional sentence, its hypothesis, and its conclusion, and its contrapositive, converse, and inverse.

B. To demonstrate an understanding of the nature of proof the student should be able to prove a theorem (stated in the form of a conditional sentence) by assuming that the hypothesis is true and then proving that the conclusion must also be true.

C. To demonstrate a further understanding of proof, the student should be able to prove (directly or indirectly) other simple theorems and write his proofs in standard two column form.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
II. <u>Career Concept</u>	
Careers require a certain degree of reasoning.	
<u>Performance Objectives</u>	

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

III. Lines and Planes

A. Lines

1. Definitions
 - a. Parallel postulate
 - b. Euclid's fifth postulate
2. Postulates
 - a. Parallel postulate
 - b. Euclid's fifth postulate
3. Conditions for parallelism
4. Theorems
 - a. Intersecting lines
 - b. Parallel lines

III. Lines and Planes

- A. To demonstrate an understanding of lines, the student should be able to:

1. Define and identify:
 - a. Coplanar lines
 - b. Corresponding angles.
 - c. Alternate interior angles
 - d. Alternate exterior angles
2. State:
 - a. The parallel postulate
 - b. The fifth postulate
3. State conditions which guarantee that two lines are parallel (equivalent forms of the parallel postulate)
4. State and prove some basic theorems involving:
 - a. Intersecting lines
 - b. Parallel lines

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

III. Career Concept

- Every career requires some special preparation.

Performance Objectives

- A. The ground crew for a football field uses parallel and perpendicular lines in laying out the field for a game.

- A. Construct a diagram of a football field given the scale of the drawing and the dimensions of the field.

CURRICULUM OUTLINE**PERFORMANCE OBJECTIVES****B. Planes****1. Definitions****2. Proofs of simple theorems**

B. To demonstrate an understanding of planes, the student should be able to:

1. Define or illustrate:

- a. Line parallel to a plane
- b. Parallel planes
- c. Line intersecting a plane
- d. Intersecting planes
- e. Line perpendicular to a plane
- f. Perpendicular planes
- g. Projection of a line on a plane

2. Prove simple theorems concerning lines and planes.

**RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES**

- E. A woodcraft designer
uses planes in many
of his designs.

**RELATED CAREER ORIENTED
LEARNING ACTIVITIES**

- B. List examples of planes in
the classroom.

CURRICULUM OUTLINE**PERFORMANCE OBJECTIVES****IV. Congruence****A. Definition of congruence**

1. Segments
2. Angles
3. Triangles
4. Quadrilaterals

B. Basic congruence postulates or theorems**C. Constructions and proofs**

1. Congruent triangles

IV. Congruence**A. To demonstrate an understanding of congruence the student should be able to define the relation "is congruent" on the set of:**

1. All segments
2. All angles
3. All triangles
4. All quadrilaterals

B. To demonstrate further understanding of congruence the student should be able to state the basic congruence postulates (SAS Postulate, SSS Postulate, and ASA Postulate) and prove basic congruence theorems. (e. g., SAA Theorem)**C. To demonstrate a further understanding of congruence, the student should be able to:**

1. Construct a triangle congruent to a given one and prove the construction is valid.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
<p>IV. <u>Career Concept</u></p> <p>Some occupations require an understanding of congruence.</p> <p><u>Performance Objectives</u></p> <p>A. Surveyors can use congruence in determining distance.</p> <p>B. A metalsmith often finds it necessary to give balance to many of his designs.</p>	<p>A. Use congruence of triangles to explain how the distance across a lake can be determined.</p> <p>B. Design a square emblem with a triangle in one corner. Give balance to the design by constructing a congruent triangle in the opposite corner.</p>

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

2. Isosceles triangle

2. Define an isosceles triangle; define the base angles of an isosceles triangle; construct an isosceles triangle and prove its base angles are congruent.

3. Equilateral triangle

3. Define an equilateral triangle; construct an equilateral triangle and prove its angles are congruent to each other.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

V. Polygons and Polygonal Regions

A. Definitions

1. Polygon
2. Convex polygon
3. Regular polygon
4. Interior
5. Polygonal region

B. Area

1. Triangular region
2. Quadrilateral region

V. Polygons and Polygonal Regions

A. To demonstrate an understanding of polygons, the student should be able to define, identify, or illustrate:

1. A polygon
2. A convex polygon
3. A regular polygon
4. The interior of a polygon
5. A polygonal region

B. To demonstrate further understanding of polygonal regions, the student should be able to:

1. Compute the area of a triangular region.
2. Compute the area of selected quadrilateral regions (e.g., square, rhombus, parallelogram, etc.)

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

V. Career Concept

Many careers require competence in the use of polygons.

Performance Objectives

- A. An architect uses a basic knowledge of polygons in creating new designs for building and other construction.

- B. Farmers often use their knowledge of quadrilaterals in selecting sites for their gardens.

- A. Examine a bridge, or a picture of a bridge and notice how many different polygonal patterns occur in its design.

- B. A farmer wants to enclose a small rectangular plot of land for a vegetable garden. Since he has only 30 feet of wire fencing, he plans to fence three sides of a rectangle, and let his garage wall act as the fourth side of the enclosure. A friend advises him to enclose a square plot for maximum area, but the farmer maintains that a rectangular plot, one of whose sides measures $7\frac{1}{2}$ feet, will have greater area. Who is correct?

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

C. Polygonal angles and sides

1. Sum of angle measures
2. Number of sides

D. Theorems

1. Pythagorean
2. Interior angles of a triangle
3. Exterior angles of a triangle

C. To demonstrate a further understanding of polygons, the student should be able to:

1. Determine the sum of the measures of the angles of a regular polygon of a given number of sides.
2. Determine the number of sides of a regular polygon of given angle sum.

D. To demonstrate a further understanding of polygons, the student should be able to:

1. State, illustrate, and prove the pythagorean theorem.
2. Define interior angle of a triangle and prove that the sum of the measures of the interior angles of a triangle is 180° .
3. Define exterior angle of a triangle and prove that the measure of an exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles of the triangle.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

CURRICULUM OUTLINE**PERFORMANCE OBJECTIVES****VI. Circles****A. Lines, arcs, segments, and points of a circle****B. Angles associated with a circle**

1. Central
2. Inscribed
3. Inscribed in a semicircle

VI. Circles**A. To demonstrate an understanding of circles, the student should be able to construct, illustrate, or define:**

1. Circle, center, and radius
2. Arc, semicircle, minor arc, and major arc
3. Chord
4. Diameter
5. Secant
6. Tangent and point of tangency

B. To demonstrate an understanding of angles associated with a circle, the student should be able to construct and define:

1. A central angle
2. An inscribed angle
3. An angle inscribed in a semicircle

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED LEARNING ACTIVITIES

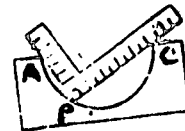
VI. Career Concept

Careers have different levels of competence and responsibility.

Performance Objectives

- A. A pattern maker makes a wood or metal pattern in the shape of the casting desired.

- A. Whenever a mechanic or a pattern maker wishes to test the accuracy of a semicircular groove or a mold, he places a tri-square in the groove as shown here. If the vertex of the right angle and the sides touch every point (A, P, C) as the tri-square moves around, he can be sure that the groove or mold is a true semicircle. What theorem of geometry is he making use of?



- B. The machinist is a skilled worker who uses machine tools to make metal parts.

- B. Machinists and tool makers often have to make cylindrical block of metal. If a machinist wishes to test the accuracy of his work, he can again use the tri-square as illustrated. If the cross-section of the cylindrical block is a true circle, the edges of the tri-square will touch the surface of the cylinder at equal distances from the heel of the square, that is, the vertex of the right angle. What theorem of geometry is he making use of?

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

C. Circular region

1. Interior
2. Segment
3. Sector

D. Theorems related to circles

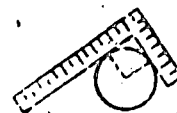
C. To demonstrate an understanding of a circular region, the student should be able to define and identify:

1. The interior of a circle
2. Segments of a circle
3. Sector of a circle

D. To demonstrate further understanding of circles, the student should be able to state and prove some basic theorems concerning circles.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES



- C. Paving contractors and cement finishers need to be able to compute the area of a circular sector.

- C. Compute the area of a sector of a circle whose central angle is 30° if the length of the radius is 25 cm. Give your answer, correct to the nearest tenth.

- D. Navigators and aviators use theorems related to circles.

- D. Every sphere has an unlimited number of great circles. Each point on a great circle is the same distance from the center of the circle. Hence, the sphere and its great circles have the same center and radius.

The shortest distance between two points on a sphere is the length of the minor arc of a great circle containing both points. When flying from Miami to London the shortest route follows the arc of the great circle passing through Miami and London. Trace the route on a globe.

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

E. Additional geometric concepts

E. To extend his concepts and skills, the student should be able to define and illustrate:

1. Equal circles and congruent circles
2. Externally tangent circles
3. Internally tangent circles
4. Concentric circles

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

VII. Similarity

VII. Similarity

A. Ratio and proportion

A. To demonstrate an understanding of ratio and proportion, the student should be able to:

1. Definitions

1. Define:

- a. Ratio
- b. Proportion
- c. Means
- d. Extremes

2. Problems

2. Solve problems involving proportions.

3. Proofs

3. Prove selected theorems concerning proportion. (e.g., the means extremes theorem)

B. Similarity between two polygons

B. To demonstrate an understanding of similarity, the student should be able to:

1. Definition

1. Define the relation "is similar to" on the set of polygons.

2. Theorems

2. Illustrate and prove basic similarity theorems.

**RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES**

**RELATED CAREER ORIENTED
LEARNING ACTIVITIES**

VII. Career Concept

Careers require competence
in computation.

Performance Objectives

A. A professional typist
uses proportion to
determine the time
necessary to type a
manuscript.

B. A surveyor is an
important person in
many types of
construction. He
measures lines and
angles, and uses
these measurements
to determine distances
which he cannot
measure directly.
He uses a great deal
of geometry and
trigonometry.

A. Donna, a professional typist,
can type 8 pages of manuscript
in 52 minutes. She agreed
to type an article of 20 pages.
How long will it take her to type
the article?

B. A and B are two points on opposite
sides of a pond. Show how to
find the distance between them by
letting C be a point on the same
side of the pond as B, and then
constructing $\triangle A'B'C'$ so
that it is similar to $\triangle ABC$

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
<p>C. Similarity in triangles</p> <ol style="list-style-type: none"> 1. Altitude to the hypotenuse in a right triangle 2. Special right triangles 3. Other triangles 	<p>C. To demonstrate an understanding of similarity, the student should be able to:</p> <ol style="list-style-type: none"> 1. Name and apply properties of the altitude drawn to the hypotenuse of a right triangle. 2. Prove the 30-60-90 relationship and the 45-45-90 relationship, then solve problems related to these special right triangles. 3. Prove that corresponding sides of similar triangles are proportional.

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES

CURRICULUM OUTLINE	PERFORMANCE OBJECTIVES
VIII. Trigonometry	VIII. Trigonometry
A. Trigonometric ratios	A. To demonstrate an understanding of elementary trigonometry, the student should be able to define the six trigonometric ratios in terms of the measures of the sides of a right triangle.
B. The table of trigonometric functions	B. To demonstrate an understanding of the table of trigonometric functions, the student should be able to: <ol style="list-style-type: none"> <li data-bbox="946 1146 1356 1247">1. Determine the sine, cosine, and tangent of a given angle. <li data-bbox="946 1289 1366 1390">2. Determine the angle whose tangent sine, or cosine is given.
C. Angle of elevation and angle of depression	C. To demonstrate an understanding of angle of elevation and an angle of depression, the student should be able to: <ol style="list-style-type: none"> <li data-bbox="946 1646 1366 1747">1. Illustrate an angle of elevation and an angle of depression. <li data-bbox="946 1789 1366 1938">2. Solve exercises involving angles of elevation and angles of depression.

**RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES**

**RELATED CAREER ORIENTED
LEARNING ACTIVITIES**

VIII. Career Concept**Performance Objectives**

B. The table of trigonometric functions is used in solving many problems.

C. An air traffic controller is in vocal contact with aircraft pilots. He is responsible for specifying the altitude at which each plane will fly.

B. The measurements of the angles read by a surveyor are applied to the solution of problems. Frequently, the trigonometric functions of these angles are not listed in the tables but require interpolation.

1. Determine the $\tan 34^{\circ} 31'$.
2. Determine the angle whose sine is .4216.

C. A helicopter takes off and climbs at an angle of 65° until it reaches an altitude of 350 meters. Determine the horizontal distance from the take-off point and the distance actually traveled by the helicopter.

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

IX. Plane Coordinate Geometry

A. Cartesian coordinate system in a plane

B. Lines

1. Distance between two points

2. Slope
a. Computation
b. Estimation

3. Equation of a line

a. Slope-intercept form
b. Two point form

IX. Plane Coordinate Geometry

A. To demonstrate an understanding of a Cartesian coordinate system, the student should be able to sketch a mathematical model of a Cartesian coordinate plane, identify axes, identify quadrants, identify the coordinates of a point, and plot a given point.

B. To demonstrate an understanding of plane coordinate geometry, the student should be able to:

1. Determine the distance between two points in a coordinate plane.

2. Determine the slope of a line from two given points on the line. Estimate the slope of a line from a given sketch.

3. Determine the equation of a line from:

a. Its slope and y-intercept
b. Two distinct points on the line

RELATED CAREER ORIENTED CONCEPTS AND OBJECTIVES	RELATED CAREER ORIENTED LEARNING ACTIVITIES
<p>IX. <u>Career Concept</u></p> <p>None necessary</p>	

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

c. Point-slope form

c. A point on the line and the slope of the line

4. Point of intersection

4. Estimate the coordinates of the point of intersection of two given lines by sketching their graphs in the same plane.

5. Equation of perpendicular line

5. Determine the equation of a line perpendicular to a given line.

6. Equation of parallel line

6. Determine the equation of a line parallel to a given line.

C. Analytical proof

C. To demonstrate a further understanding of coordinate geometry, the student should be able to make a simple geometric proof by means of coordinates.

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

X. Solid Figures

A. Terminology

1. Polyhendron
2. Cylinder
3. Prism
4. Cone
5. Pyramid
6. Sphere

B. Area

X. Solid Figures

A. To demonstrate an understanding of solid figures, the student should be able to identify and illustrate:

1. Polyhedron
2. Cylinder
3. Prism
4. Cone
5. Pyramid
6. Sphere

B. To demonstrate a further understanding of solids, the student should be able to compute the lateral area and the total area of:

1. A cylinder
2. A cone
3. A pyramid

RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES

RELATED CAREER ORIENTED
LEARNING ACTIVITIES

X. Career Concept

Careers require different
levels of computation.

Performance Objectives

- A. A woodcraft designer
requires a basic
understanding of solid
figures in his work.

- B. A cabinet maker must
be able to compute the
surface area of a
rectangular solid.

- A. Collect information from the local
hobby shops showing the different
shapes of wooden objects. Identify
each figure as a rectangular solid,
cube, pyramid, cylinder, sphere,
or cone. Collect pictures from
magazines, catalogs, and news-
paper advertisements to identify
the many different polyhedrons.

- B. John and his father planned to buy
material to build a trophy case. The
case was to be 12 feet long, 4 feet
high, and 1 foot wide. The front,
top, and two ends were to be glass.
Compute the number of square feet
of glass needed. Compute the
number of square feet of plywood
needed for the back and bottom.
(Do not consider shelving.)

CURRICULUM OUTLINE

PERFORMANCE OBJECTIVES

C. Volume

C. To demonstrate a further understanding of solids, the student should be able to compute the volume of:

1. A tetrahedron
2. A cylinder
3. A prism
4. A cone
5. A pyramid
6. A sphere

**RELATED CAREER ORIENTED
CONCEPTS AND OBJECTIVES**

- C. The oil refinery plant manager must calculate volume.

**RELATED CAREER ORIENTED
LEARNING ACTIVITIES**

- C. Each cylindrical oil tank at a storage plant has a radius of 45 feet and a height of 110 feet. What is the total capacity of 35 tanks? (There are 7.5 gallons in 1 cubic foot.)